Natural Heritage &
Endangered Species
Program

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MASSACHUSETTS ENDANGERED WILDLIFE

Northeastern Beach Tiger Beetle
(Cicindela dorsalis dorsalis)

DESCRIPTION: The Northeastern Beach Tiger Beetle is an active coastal predator, approximately 13.0 to 15.5 mm (0.5 to 0.6 inches) in length, with a bronze green head and thorax, long slender legs, and white or tan elytra (wing covers) which are often finely imprinted with dark lines. Tiger beetles are so named because of their "tiger-like" behavior of chasing down prey and capturing the victims with their long mandibles.

The larval form of the Northeastern Beach Tiger Beetle is pale in color, with one pair of antennae on the head, an iridescent black and green pronotum (analogous to a "neck") covered with setae (hairs), and a long segmented abdomen.

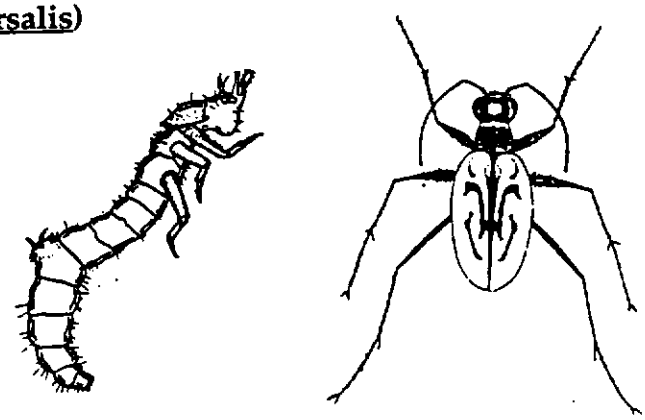
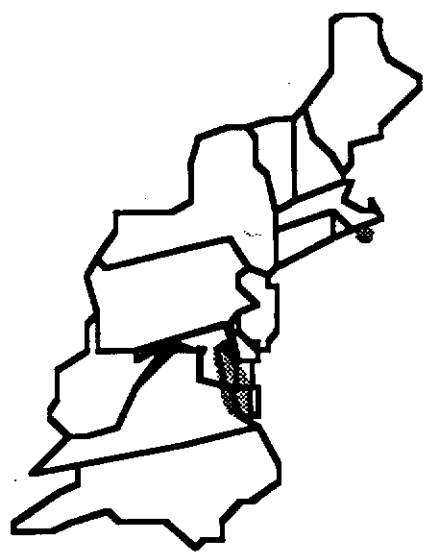


Illustration of adult beetle by Josephine Thoms, 1989
Illustration of larval beetle from Dillon & Dillon, Common Beetles of Eastern North America, 1972

SIMILAR SPECIES IN MASSACHUSETTS: The Northeastern Beach Tiger Beetle is one of four subspecies of C. dorsalis; however, none of the other three subspecies occurs in Massachusetts, and it is not easily confused with other tiger beetle species occurring in the state. Cicindela hirticollis is found on coastal beaches, including the single beach in the state inhabited by C. dorsalis dorsalis; however, its elytra are much darker and differently patterned. C. lepida more closely resembles C. dorsalis dorsalis because it also has white elytra but its body is more slender and much smaller in size; furthermore, this species has been documented in the state only once, over 75 years ago.

RANGE: The Northeastern Beach Tiger Beetle is very restricted in range. Historically it could be found along the Atlantic coastline from Massachusetts to Virginia. Today, it is found only at the extremes of its former range, in the Chesapeake Bay area adjacent to Maryland and Virginia, and a single beach on one of Massachusetts' offshore islands.



Current Range of
Northeastern Beach Tiger Beetle

HABITAT IN MASSACHUSETTS: In general, C. dorsalis dorsalis requires large, highly exposed beaches with fine sand particles and a low amount of human disturbance. The sole population of Northeastern Beach Tiger Beetles in Massachusetts inhabits an exposed offshore barrier beach, ranging in width from 15.5 to 34 meters (50 to 110 feet), with a mixture of high, well defined dunes and low, unstable dunes at the upper end of the beach. The predominant form of

vegetation on the dunes and upper beach is beach grass (Ammophila breviligulata). The beach is relatively pristine and undisturbed by human activities.

LIFE CYCLE / BEHAVIOR: Emergence of adult Northeastern Beach Tiger Beetles occurs from early June to mid-August, peaking in mid-July. The adults forage in the intertidal zone where they scavenge on dead fish and prey on invertebrates for much of their food. They are primarily diurnal, but they are also quite active at night from mid-July to late August. Mating occurs from late July to early August, after which the female Northeastern Beach Tiger Beetles oviposit (lay their eggs) in the intertidal zone. By September, most if not all of the adult beetles have died.

Northeastern Beach Tiger Beetles have a two-year life cycle. Older larvae (2nd and 3rd "instars" or larval stages) which overwintered first appear in late May and June, while 1st instar larvae appear in mid-August. The larvae dig tiny vertical burrows in the sand. The position of the burrows changes over the course of the year; in late spring, the burrows of larvae that have overwintered are located well up the beach near or beyond the edge of vegetation. In midsummer, the burrows of young recently-hatched larvae are within a few meters of the high-tide line; by autumn, the burrows are once again at the upper end of the beach. The changes in larval burrow location parallel the erosion-accretion cycle of the beach: the beach widens in the summer as sand is deposited, and narrows in the fall and winter as stronger winds and waves transport the sand offshore. The depth of the burrows also increases with each successive instar.

Older larvae appear to be dormant through much of the summer, but the young larvae are extremely voracious. Their sensory organs can detect the vibrations made by nearby invertebrate prey; when the prey is close enough, the larval tiger beetle's head lunges out of its burrow opening and captures its victim with its strong serrated jaws, then drags it into the burrow and devours it. Larvae develop through 3 instars and overwinter twice before finally emerging as adults. The primary food of larvae is "sand fleas" (amphipods), which can be very numerous and occur in wet sand and under the sea-wrack.

POPULATION STATUS IN MASSACHUSETTS: The Northeastern Beach Tiger Beetle is classified as an Endangered species in Massachusetts and is also federally classified as Threatened. Only one current site has been documented in the state for C. dorsalis dorsalis. The Northeastern Beach Tiger Beetle formerly inhabited several beaches on outer Cape Cod and a number of the offshore islands, but it has not been found at any of these beaches (with one exception) for many years. Increased human recreational pressure on these beaches, particularly intensive off-road vehicle traffic, is believed to be largely responsible for the disappearance of these populations, as well as many others along the Atlantic Coast. ORV's can kill adults and larvae directly by crushing them. ORV's also can continually damage the larval burrows; as a result, the larvae must reduce their feeding time and expend a considerable amount of energy to repair the burrows.

The proximity of the larval burrows to the high-tide line in mid-summer increases their chance of being washed away; a severe storm or early season hurricane at this time could potentially wipe out the entire state population; this likelihood makes the probability of extinction very high.